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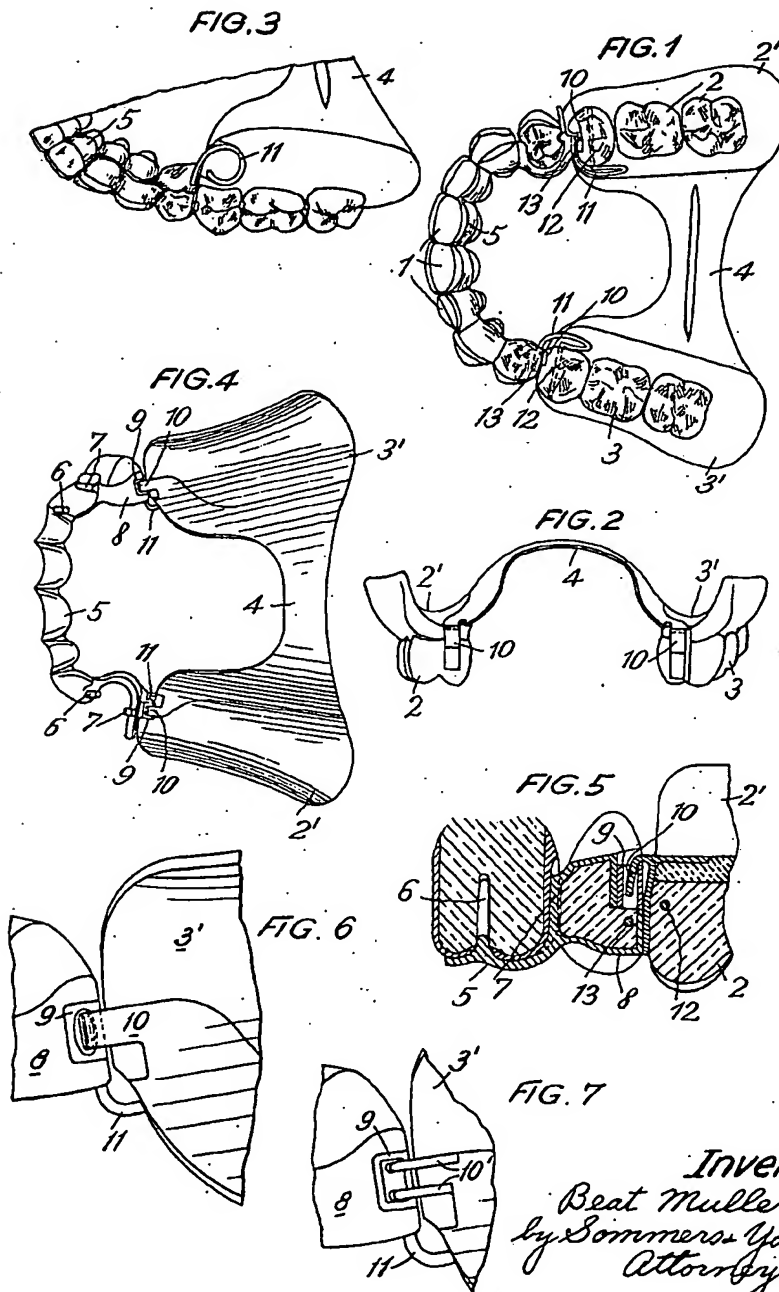
B. MULLER

2,594,200

REMOVABLE PARTIAL DENTURE

Filed June 2, 1948

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

FIG. 8

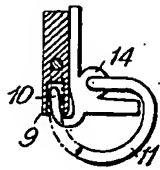


FIG. 9

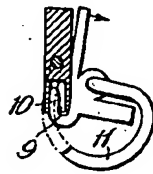


FIG. 10

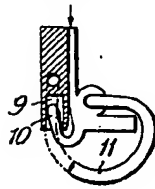


FIG. 11

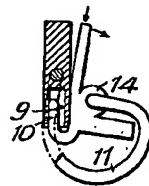


FIG. 12

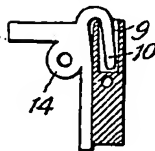
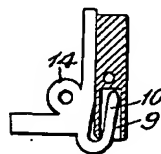


FIG. 13



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UNITED STATES PATENT OFFICE

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REMOVABLE PARTIAL DENTURE

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In Switzerland June 7, 1947

1 Claim. (Cl. 32-5)

1 The arrangement of anchoring a free-end denture to the wearer's original front teeth is essential for the proper functioning of the denture. The rigid clamps used in prior-art anchoring-means endanger the pier teeth of the wearer's original teeth during mastication. Although sinkable or depressible clamps eliminate such risk, they do not prevent the denture from wobbling. Resilient riding-clamps satisfy to some extent the requirements for a removable partial denture, but the requisite stabilizing means, such as a tilt-preventing arm or an endless clamp are inconveniently raised from the residual original teeth.

The denture built and arranged according to my present invention, which may be unilateral or bilateral, avoids the deficiencies and drawbacks of prior-art free-end dentures and of their anchoring-means respectively.

In accordance with my present invention, one part of the articulation is adapted to form an abutting-hook and the other an eyelet, for engaging the said hook, the said two parts being rigidly connected to the denture saddle and the wearer's remaining teeth respectively, and the said hook being engaged with slack in the said eyelet in order to allow during mastication, aside from a depressing of the denture into the mucous membrane, adjustments of the denture at right angles to the movement of the articulation, such adjustments being limited by the abutment of the hook against the eyelet. The said hook suitably is secured to the denture saddle, and the eyelet to the said original teeth.

The said hooks suitably are of flat cross-section, and the said eyelet suitably has a rectangular aperture, the hook being inclined with respect to the long sides of the rectangular aperture.

Between said hook and eyelet a looped spring wire is provided, such wire having two legs for the purpose of transmitting, during mastication, a load from the denture saddle onto the said original teeth.

One form of my present invention is shown, by way of example, in the accompanying drawing, in which:

Fig. 1 shows a top view of a bilateral removable partial denture jointed to the wearer's remaining original front teeth,

Fig. 2 a front view of the said denture without said original teeth,

Fig. 3 is a perspective tilted view of one denture side and of the said original teeth,

Fig. 4 is a top plan view of the bilateral denture including a continuous clamp,

Fig. 5 in larger scale and vertical section, the joint between the said original teeth and the denture proper.

Fig. 6 an enlarged partly modified joint, and Fig. 7 a further partly modified joint in an enlarged view similar to Fig. 6.

Figs. 8 to 11 illustrate progressive positions of the joint in operation,

Fig. 12 shows a joint of a denture of the upper jaw, and

Fig. 13 shows a joint for a lower denture.

The wearer's remaining original front teeth form an abutment for movably anchoring the bilateral denture. The latter comprises a palatal member 4 having integral saddles 2', 3' at its ends. The saddles 2', 3' have artificial-teeth 2, 3, secured thereto, and are adapted to lie freely against the alveolar ridge. The said original teeth are braced by a continuous clamp 5 which is engaged by pins 6 and pin-like lugs 7 to said original teeth. The clamp 5, mounted onto the teeth 1, constitutes a member of the latter.

The ends of clamp 5 are formed as joint-carriers. Eyelets 9 having rectangular apertures (Figs. 4, 5) are secured to the joint-carriers of the teeth 1 and clamp 5. The said eyelets form a part of the joints between the teeth 1 and the said denture-portions 2, 3 or 2', 3' respectively. The other part of said joints are formed by a hook 10 of flat cross-section. The tongues of the hooks 10 are engaged in the eyelet 9 (Fig. 5).

As shown in Fig. 5, the hook 10 has a certain amount of play in the eyelet-aperture with respect to the articulated movement and also at right angles to the latter so as to allow the denture not only a movement in the sense of the articulation, but also an adjusting-movement at right angles to the latter. The hook 10 is inclined with respect to the larger wall faces of the rectangular eyelet-aperture at an angle which defines a hinge-movement of the denture on the jaw-crest or the mucous membrane, respectively, during mastication, in that the denture part performs a swinging-movement in the joint until the inside face of the longer hook-leg abuts against the outside of the eyelet. In mastication, no seizing arises in the joints, since difference between the amounts by which the jaw-crest and mucous membrane are depressed is only a fraction of the amount of relative movement allowed by the joint.

Further, a looped spring wire 11 is provided on each of the two joint-locations, and the paral-

lel legs 12 and 13 thereof—which stand at right angles to the eyelet—are mounted in the denture part or in the said original teeth. The springs 11 serve for the purpose of transmitting, in mastication, a load from the denture saddle onto the wearer's original teeth. The rounded loop portion of the springs is flush with the inside wall of the denture parts so that the wearer's tongue is not hindered by any projecting parts and portions.

The joints or articulations in the case of the bilateral denture are so disposed that they will stand in the wearer's mouth vertically above the crowns of the jaw-crests.

In the case of unilateral free-end dentures, the joint for the respective jaw side, has to be so disposed that the line of connection through both joints forms a right angle with the crown of the toothless jaw-crest.

In the modification shown in Fig. 6, the aperture of the eyelet 9' is oval or elliptical instead of rectangular as in Figs. 1-5. The flat hook 10 also may be rounded off at the point where it contacts the eyelet-wall.

In the modification shown in Fig. 7, the hook comprises two spaced wire parts 10' which are parallel to each other.

Figs. 8-11 serve for explaining the function of the joint, the body of the eyelet being lengthened in a modified construction to that shown in Fig. 5, the legs of the looped spring 11 being mounted in the body of the eyelet and in an eye 14 provided on the hook 10 respectively.

In Fig. 8 the parts of the joint and the spring are in their position of rest; the longer hook-leg abuts against the outside of the eyelet; the inner face of the shorter hook-leg being spaced from the inner wall of the eyelet and inclined relative to the longer hook-leg.

In Fig. 9 the parts of the joint have performed an oscillation movement resulting from the adjustment movement of the saddle which movement is limited by the inner face of the longer hook-leg abutting against the outer wall of the eyelet.

Fig. 10 shows how the joint may perform a pure sliding movement by which the depth to which the shorter hook-leg projects into the eyelet is reduced as compared with Fig. 6 in order to permit a movement of the saddle towards the yieldable tissue of the jaw. This movement may be temporary during the mastication or permanent owing to a shrinking of the jaw crest. The looped spring opposes this sliding movement in a resilient manner and prevents the hook from leaving the eyelet.

Fig. 11 illustrates how the joint carries out a combined oscillating and sliding movement.

Fig. 12 shows the arrangement of the joint parts for a denture of the upper jaw and Fig. 13 of the lower jaw.

The removable partial denture described above

is suited equally well both for lower jaw and upper jaw cases. The dimensions of the joints or articulations are very small. The joints are not subject to any masticating-pressure and, thus, to no appreciable wear, and may be taken to pieces for the daily cleaning. The hook 10 finds a precise abutment on the eyelet, thus ensuring an absolutely stable equipoise or trim to the non-loaded saddle. In mastication, the hook and eyelet sink intermittently into the mucous membrane, but prevent any undesirable saddle movements. The joints described protect the anchor teeth from being unduly biased by the saddle of the free-end denture.

What I claim as new and desire to secure by Letters Patent is:

In a removable partial denture in combination, a palate member having an end portion adapted to lie freely against the alveolar ridge, a continuous clamp to be rigidly fixed to the wearer's remaining original front teeth, a joint structure for removably and yieldingly connecting said palate member to said continuous clamp and comprising two portions, one a hook and the other an eyelet in which said hook is engaged for movement relative thereto, one of said portions of the joint structure being rigidly fixed to said end portion of the palate member and the other to said continuous clamp, said hook having a leg inserted with play in said eyelet and permitting a lengthwise movement of said leg in the direction out of the eyelet to allow the palate member to sink into the mucous membrane during mastication, said hook also having another leg longer than said first mentioned leg, arranged to abut against an outer face of said eyelet for limiting the oscillation motion between said joint portions and thereby the adjustability of said palate member, and a looped wire spring provided intermediate of the said eyelet and hook and having two legs standing at right angles to the eyelet, said spring serving the purpose of resiliently limiting the extent to which said palate member sinks into the mucous membrane and for preventing disengagement of the hook and eyelet.

BEAT MÜLLER.

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